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GAD-2311 Seat No._____

B. Sc. (Sem. V) Examination

November / December – 2013

Biotechnology : Paper - CC - 502 - I - VIII

(Molecular Genetics) (New Course)

Time : 3 Hours] [Total Marks : 70

1 Answer any fourteen of the following : 14

(i) Cellular DNA replication
  (a) is known as transcription
  (b) require the DNA double helix to be unwound
  (c) occurs in the 3' to 5' direction.
  (d) starts by tus protein.

(ii) For 5' capping of m-RNA _____ is required.
  (a) RNA polymerase
  (b) DNA polymerase
  (c) Poly A polymerase
  (d) Poly A transferase

(iii) Which is amber codon ?

(iv) What is Linker DNA ?

(v) What is Hogness box ?

(vi) Define intron.

(vii) What is the function of topoisomerase II ?

(viii) Define Repressor.

(ix) Write the function of SSB.

(x) Name the unusual amino acids found in t-RNA.

(xi) In DNA structure which bond is found between sugar and nitrogen base ?

(xii) Which of the following characteristics distinguishes most RNA molecules from DNA ?
  (a) a purine or pyrimidine base linked to a pentose sugar

(b) a 3' – phosphate group linked to a pentose sugar.

(c) a 5' – phosphate group linked to a pentose sugar.

(d) Susceptibility to alkaline hydrolysis.

(xiii) The role of sigma factor in prokaryotic transcription is

(a) in proper assembly of RNA polymerase

(b) to prolong the RNA synthesis activity of RNA polymerase

(c) to keep RNA polymerase subunits intact during transcription.

(d) to help specific binding of RNA polymerase to promoter region for initiation of transcription.

(xiv) Which of the following DNA polymerase have 5' $\rightarrow$ 3' exonuclease activity.

(a) Pol I

(b) Pol II

(c) Pol III

(d) All of above

(xv) Name the sequence of mRNA where ribosome bind in prokaryote.

(xvi) Which is the common form of DNA ?

2 Give answer in short : (any eight) **16**

(i) Write the splicing mechanism of group-I introns.

(ii) Write proof reading mechanism of ribosome.

(iii) What is capping ?

(iv) Give the characteristics of 5' and 3' splice site.

(v) List out the factors involved in prokaryotic translation initiation.

(vi) What are tus and ter ?

(vii) Discuss degeneracy of genetic code.
(viii) What is mRNA scanning ?
(ix) What are constitutive and inducible expression of genes ?
(x) What is nucleosome ?

3 Write short note on any four of the following : **20**
(i) Different types of transposable elements.
(ii) Splicesome formation.
(iii) DNA topology.
(iv) Lac operon
(v) DNA polymerase of prokaryotes and eukaryotes.
(vi) Telomerase.

4 Discuss in detail : (any two) **20**
(i) Eukaryotic genome organization.
(ii) Initiation and termination of replication in prokaryote
(iii) Different forms of RNA
(iv) Eukaryotic translation.
